Underground Injection Control

in California

Water Division
US EPA Region 9
May 2016

Current Events


San Francisco Chronicle

Oil waste pumped into state's aquifers

Los Angeles Times

LOCAL / CALIFORNIA

State lawmakers slam oil regulators after embarrassing lapses

San Francisco Chronicle

EDITORIALS

Regulatory snafu in oil fields may be tainting water supplies

San Francisco Chronicle | March 6, 2015 | Updated: March 6, 2015 2:01pm

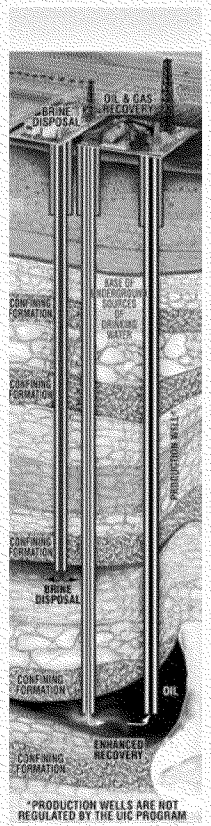
› protest a meeting that they say
Tuesday March 24, 2015. (Tho

SFGATE http://www.sfgate.com/business/article/State-let-oil-companies-taint-drinkable-water-in-6054242.php

State let oil companies taint drinkable water in Central Valley

By David R. Baker Updated 12:11 pm, Sunday, February 1, 2015

Outline



Background:

- ❑ SDWA & UIC Program
- ❑ Well Classes
- ❑ Class II Wells
- ❑ USDWs/Aquifers
- ❑ AEs & AE Approval
- ❑ AE Considerations & Checklist

California Class II UIC Program:

- ❑ UIC Program & State Primacy
- ❑ EPA Audit & Review
- ❑ Well Investigation by State
- ❑ Well Closure & Evaluation
- ❑ EPA Request for Compliance
- ❑ State UIC Revision Plan
- ❑ EPA Response to Plan
- ❑ Legislative Action
- ❑ Latest News

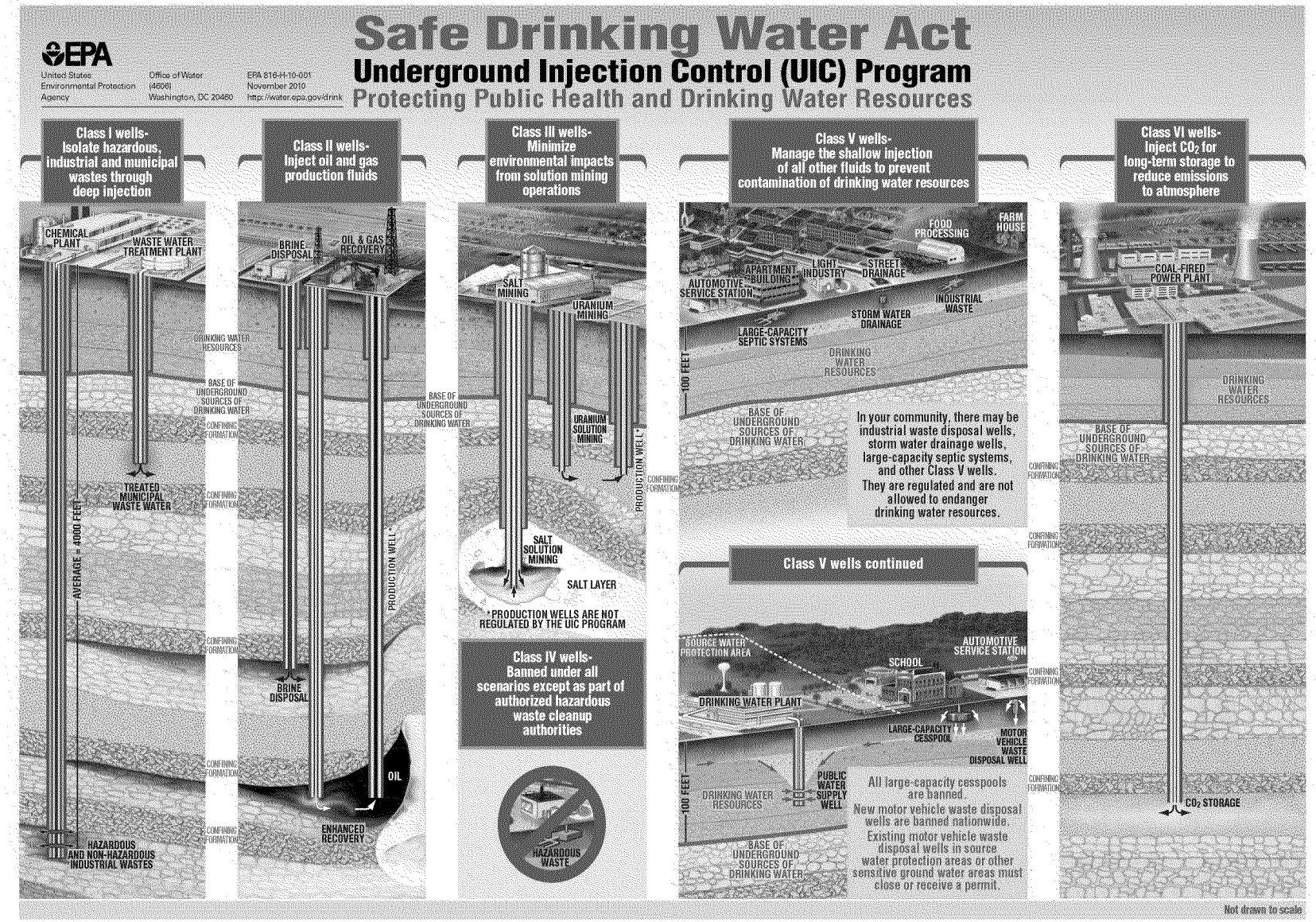
SDWA & UIC Program

The Safe Drinking Water Act (**SDWA**) is the main federal law that ensures the quality of Americans' drinking water.

The Underground Injection Control (**UIC**) Program is responsible for regulating the construction, operation, permitting & closure of injection wells that place fluids underground for storage or disposal. There are 6 categories of UIC wells (well Classes I – VI).

SDWA & the UIC Program are designed to protect by preventing endangerment of underground sources of drinking water (**USDW**s).

Well Classes



Class II Wells

What is a Class II Well?

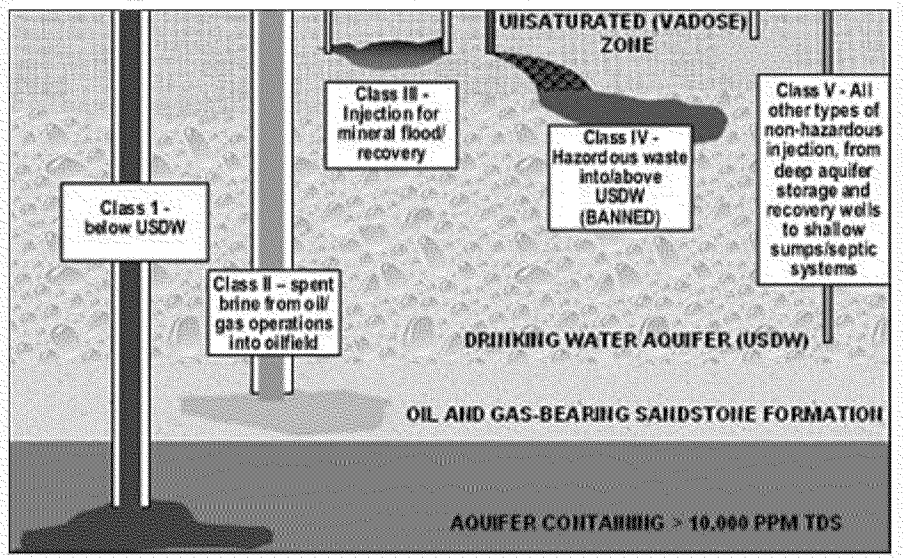
Class II wells inject fluids associated with oil & natural gas production. Most of the injected fluid is salt water (brine), which is brought to the surface in the process of producing (extracting) oil & gas. In addition, brine & other fluids are injected to enhance (improve) oil & gas production.

How do Class II wells protect drinking water resources?

By injecting the brine deep underground, Class II wells prevent surface contamination of soil & water.

What are the types of Class II wells?

- enhanced recovery wells
- disposal wells
- hydrocarbon storage wells.



USDWs/Aquifers

What is an USDW?

An aquifer or portion of an aquifer that:

- supplies any public water system *or*
  contains a sufficient quantity of ground water sufficient to supply a public water system, *and*
- currently supplies drinking water for human consumption, or
- contains fewer than 10,000 mg/L total dissolved solids (TDS) *and* is not an exempted aquifer.

All USDWs are required to be protected by the UIC program.

What is an aquifer?

An underground geologic formation that is capable of yielding a significant amount of water to a well or spring.

AEs

What is an aquifer exemption (AE)?

40 CFR 144.16 allows EPA to exempt certain USDWs from SDWA protection if:

- they contain oil or minerals
- recovery is impracticable
- they are contaminated
- they contain total dissolved solids (TDS) greater than 3,000 mg/L.

Requests for AEs are typically received from injection well operators as a separate part of a UIC permit application.

AEs allow injection into an aquifers which would otherwise be prohibited by the UIC program.

AEs have been primarily used to allow mineral, hydrocarbon or geothermal energy production.

AE Approval

All aquifer exemptions require EPA review & approval.

EPA has final responsibility for AE decisions, even if a state has primacy for the UIC program.

The Regions handle simple requests, while HQ is also involved with complex requests.

In approving an AE, EPA makes a determination that the proposed exemption area is not currently being used as a source of drinking water & will not be used as a source of drinking water in the future.

EPA also determines that no drinking water wells exist beyond the exemption boundary (1/4 mile minimum) that may draw water either currently, or in the future, from the proposed exempted portion of the aquifer. The boundary is based on where the injected fluids & any contaminants released from the aquifer as a result of injection are expected to flow.

AE Considerations

Factors to consider when demonstrating that an aquifer cannot now & will not in the future serve as a source of drinking water or an aquifer is not reasonably expected to supply a public water system:

- mineral, hydrocarbon or geothermal producing
- likelihood that the water in the exempted area would need to be used as a drinking water source in the future
- remoteness / low population
- availability of alternative water supplies to satisfy future drinking water needs
- available treatment or drilling technologies
- cost of obtaining drinking water from deeper aquifers.

AE Checklist

EPA HQ sent a memo to the Regions in 2014 re enhancing coordination & communication with States on review & approval of AE requests under SDWA. Attached AE Checklist included

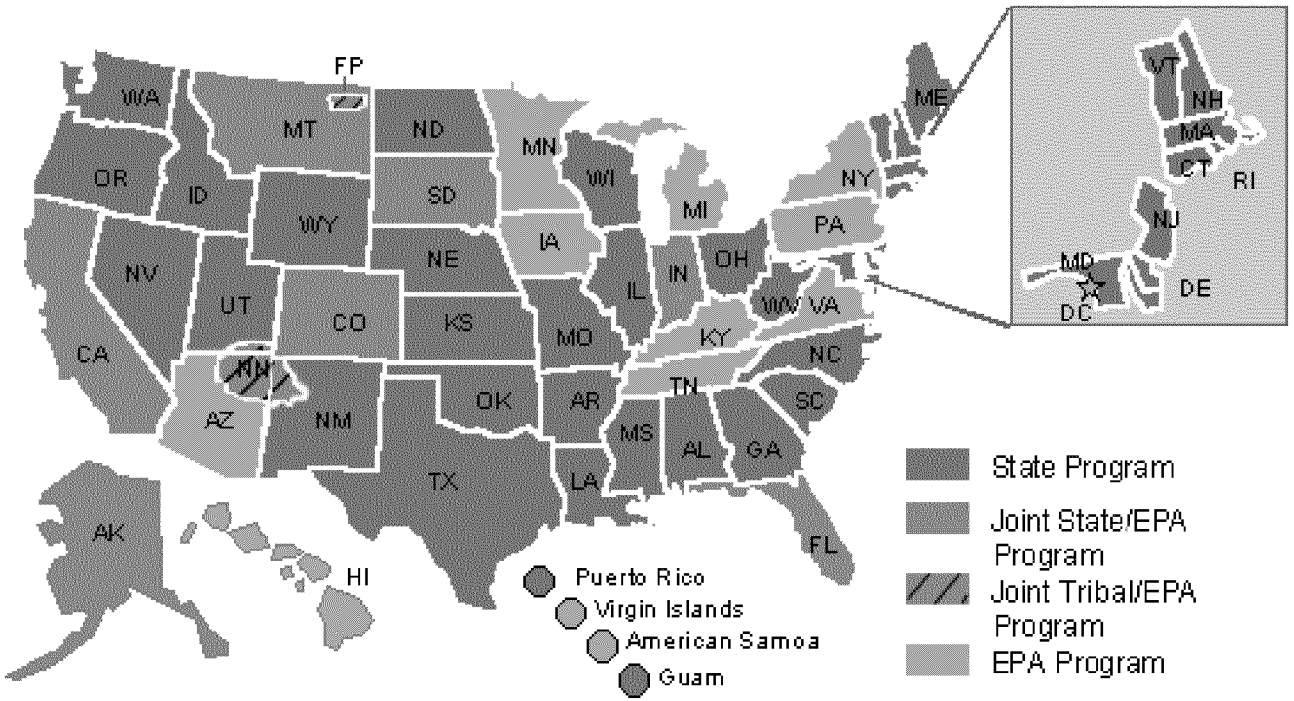
Aquifer Exemption Checklist

Reviewed by: _____ *Date*_____

A. Regulatory background & purpose
B. General Information
C. Regulatory Criteria per 40 CFR146.4 (Criteria for Exempted Aquifers) – demonstrations that aquifer
   - doesn't currently serve as source of drinking water
   - is mineral, hydrocarbon or geothermal energy producing
   - is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical
   - is too contaminated
   - has TDS > 3,000 & <10,000 mg/L & is not reasonably expected to supply a public water system.

UIC Program Primacy

- 33 states & tribes have primary enforcement authority (primacy) for the UIC program
- EPA & states share program implementation in 7 states
- EPA directly implements the entire UIC Program in 10 states.



* The Fort Peck (FP) Tribes and the Navajo Nation (NN) are currently the only Tribes with UIC Primacy

State Primacy

March 1983: The California Division of Oil, Gas & Geothermal Resources (DOGGR) was granted primacy to implement the Class II UIC program.

Petroleum Industry's Contribution to California's Economy

Sales -	$143 billion (direct, indirect and induced)
Employment -	364,032 jobs (direct and indirect)
Wages -	$22 billion (direct, indirect and induced)
Taxes -	$5 billion

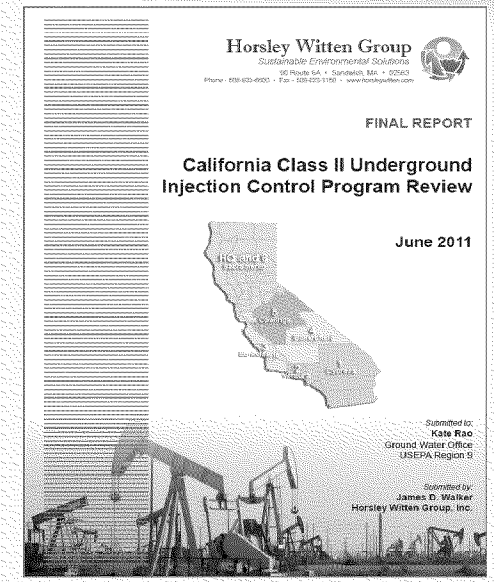
Source: LECG, based on 2004 data

Top Crude Oil Producing States, 2011

Source: U.S. Energy Information Administration, *Petroleum Supply Monthly* (April 2012), preliminary 2011 data.

There are a total of **50,000** Class II injection wells in California.

EPA Audit & Review



2011: EPA conducted an audit of the State Class II UIC Program, identifying deficiencies such as how the State defines protectable USDWs & their methods for identifying an appropriate Area of Review when permitting new wells.

2012: EPA conducted a preliminary review of AEs in California, which indicated injection into fresh formations & beyond AE boundaries.

INJECTION WELLS IN CALIFORNIA

Total # of Class II Wells in California	50,000

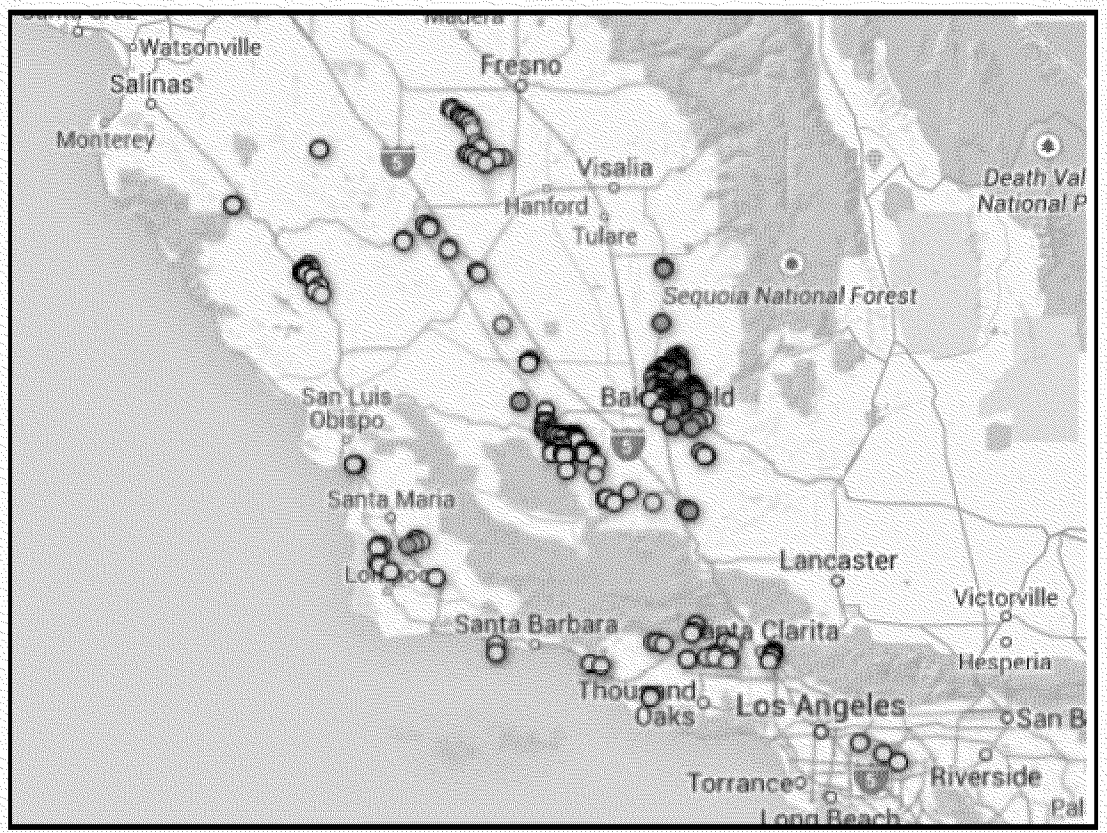
 # Potentially Injecting into Non-Exempt Aquifers by Type

Waste Disposal Wells	532
Enhanced Oil Recovery (EOR) Wells	2,021
Cyclic Steam EOR Wells	3,500 (estimated)

Well Investigation by State

June 2014: DOGGR, working with the State Water Resources Control Board (**Water Board**), identified instances where

- injection had been permitted into non-exempt aquifers containing high quality water
- Injection wells were located in the vicinity of water supply wells.



Wells under Investigation

as of August 2014

- 0-3000 ppm
- 3000-10000 ppm
- unknown

Well Closure & Evaluation

July 2014: DOGGR ordered operations ceased at 11 wells due to injection in non-exempt high quality aquifers.


Thursday, Jul 31 2014 04:14 PM

State shuts another Kern oil injection well

BY JOHN COK Californian staff writer jcox@bakersfield.com

July 2014: EPA requested that DOGGR & the Water Board (**the State**) provide

- ✓ drinking water source evaluation from improper Class II injection
- ✓ documentation on AEs.

September 2014: The State responded to EPA, describing their identification & assessment efforts to date.

EPA Request for Compliance

December 2014: EPA issued a follow up request for a UIC Program Revision Plan by February 2015 to ensure program compliance by <u>February 15, 2017</u>, addressing

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

December 22, 2014

Jonathan Bishop
Chief Deputy Director
California State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Steven Bohlen
Oil and Gas Supervisor
Division of Oil, Gas and Geothermal Resources
California Department of Conservation
801 K Street, MS 18-05
Sacramento, CA 95814-3530

Dear Messrs. Bishop and Bohlen:

- ✓ Class II wells that may be injecting into non-exempt aquifers
- ✓ process for consideration/submittal of new & expanded AEs
- ✓ review of exempt aquifers using new data.

State UIC Revision Plan & AE Workshops

CA Reviewing Oil Wells as EPA Cracks Down on "Mismanaged" Program

© AP Photo/ Rich Pedroncelli
Environment
04:52 10.02.2015(updated 10:51 10.02.2015)

The US Environmental Protection Agency is going to review California's underground injection control program amid concerns about the impact of oil and gas companies on the quality of drinking water in the region, the EPA told Sputnik.

The New York Times | http://nyti.ms/1zre1Vv

U.S. | NATIONAL BRIEFING | WEST

California: Water Safety Plan Sent to E.P.A.

By THE ASSOCIATED PRESS FEB. 9, 2015

February 2015: The State submitted the requested Class II UIC Program Revision Plan.

February and March 2015: State-sponsored workshops concerning AE proposal requirements were held in Bakersfield & Long Beach for oil & gas operators.

EPA Response to Plan

California Class II UIC Program Corrective Action Plan Schedule

A. Drinking Water Protection Well Evaluations

- Complete evaluations for "Category 1" injection wells **(M**
- Complete evaluations for "Category 2" injection wells **(Ju**
- Revise Enclosure B of the State's February 6th letter to inc schedule for completing a review of these wells and subm applicable, to meet the February 15, 2017 compliance de
- Complete evaluations for "Category 3" injection wells **(F**

B. Well Shut-Ins

- Shut-in deadline for wells injecting into non-exempt, non below 3,000 mg/l TDS **(October 15, 2015)**
- Shut-in deadline for wells injecting into the 11 aquifers hi exempted by EPA pursuant to this corrective action plan
- Shut-in deadline for all existing wells injecting into non-e mg/L TDS **(February 15, 2017)**

C. Aquifer Exemption Process

- Issue Aquifer Exemption Guidance **(April 1, 2015)**
- Deadline for submission to EPA of all proposed aquifer exemptions for Category 1 wells injecting into aquifers containing 3,000 mg/L TDS or less (excluding wells injecting into the 11 aquifers historically

March 2015: EPA responded to the State's plan, specifying a schedule of required activities & deliverables with target milestones & deadlines, in order to track progress towards meeting the February 2017 compliance deadline.

Legislative Action

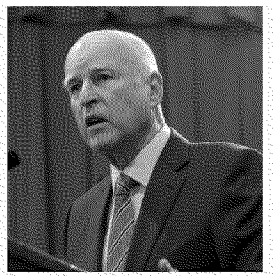
March 2015: The CA State Legislature held a joint oversight hearing of the Senate Natural Resources & Water and Environmental Quality Committees titled "Ensuring Groundwater Protection: Is the UIC Program Working?"

March 2015: 6 state senators wrote to Gov. Brown requesting steps be taken to stop illegal injection into non-exempt aquifers until there is proper review and appropriate exemptions are granted.

BUSINESS

Lawmakers demand oil firms stop pumping waste into aquifers

By David R. Baker | March 20, 2015 | Updated: March 20, 2015 7:32pm



"The State should not wait until sources of drinking or irrigation water are polluted, especially given the dire situation that has been created by the current drought," the legislators wrote in a letter to Brown.

Legislative & County Gov't Action

March 2015: 4 members of the US Congress wrote to DOGGR requesting that all wells under investigation be shut down immediately.

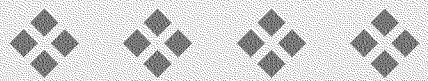
The members of Congress also stated that if DOGGR determines this is not prudent, DOGGR's primacy under SDWA will be questioned.

❖ ❖ ❖ ❖

March 2015: The Kern County Board of Supervisors wrote to Administrator McCarthy requesting that EPA not order the further closure of any injection wells.

State Reports to Legislature

July 2015: DOGGR submits assessment of UIC program, including a detailed review of activities in the Cypress District. “Cypress Report” highlights AOR concerns with numerous approved injection projects.



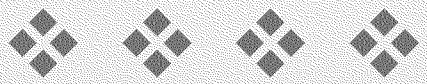
October 2015: DOGGR issues “Renewal Plan for Oil and Gas Regulation.” Plan addresses regulatory updates, data management, and staffing for oil/gas oversight. Includes elements of EPA’s Compliance Plan, and adds state-wide UIC project-by-project review.

Aquifer Exemption Requests

February 2016: State submits request for expanded exemption in Arroyo Grande field, SLO County. EPA requests supplemental data regarding hydraulic isolation and current source analysis. NGO, locals voice opposition.

May 2016: The State continues to work with operators to develop AE requests. There could be as many as several dozen requests submitted this year.

ANY QUESTIONS??



Thanks for coming!!